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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,269	09/26/2001	Stephen A. Morgan	NTR-100US	8378

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EXAMINER	
WALLING, MEAGAN S	
ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 04/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/963,269	MORGAN, STEPHEN A.	
	Examiner	Art Unit	
	Meagan S Walling	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *26 September 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *29-36,46 and 47* is/are allowed.

6)☒ Claim(s) *1-10,14-21,24-26,37 and 44* is/are rejected.

7)☒ Claim(s) *11-13,22,23,27,28,38-43 and 45* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-5, 10, 16, 18, 20, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by White et al. (US 4,755,957).

Regarding claim 1, White et al. teaches an input means for obtaining the plurality of operating parameters from the refrigerant based system (Fig.1, Ref. 16 and 17); memory means for storing a plurality of baseline operating parameters (column 4, lines 20-21); and a processing means coupled to the input means and the memory for processing the plurality of operating parameters based on the plurality of baseline operating parameters (column 2, lines 41-44), generating a processing result, and providing the processing results and prompts to a user (column 2, lines 47-51).

Regarding claim 2, White et al. teaches indicating deficiencies in the refrigerant based system (column 2, lines 47-49).

Regarding claim 3, White et al. teaches prompts to provide the user with instructions to correct the deficiencies in the refrigerant based system (column 2, lines 50-51).

Regarding claim 4, White et al. teaches providing the user with diagnostic information based on the processing result from the processing means (column 2, lines 45-47).

Regarding claim 5, White et al. teaches prompts that provide the user with information to identify a problem with the refrigerant based system (column 2, lines 45-47).

Regarding claim 10, White et al. teaches display means coupled to the processing means to display the processing result and the prompts to the user (Fig. 1, Ref. 21).

Regarding claim 16, White et al. teaches that the refrigerant based system is a mobile system (column 1, line 9).

Regarding claim 18, White et al. teaches that the device is portable (column 4, lines 1-2).

Regarding claim 20, White et al. teaches a communication port coupled to the processing means (column 4, lines 25-29).

Regarding claim 37, White et al. teaches obtaining a plurality of parameters from a refrigerant based system (column 2, lines 35-38); storing a plurality of baseline operating parameters (column 2, lines 42-44); processing the plurality of operating parameters based on the plurality of operating parameters and generating a processing result (column 2, lines 41-47); and providing the processing result and prompts to a user based on the processing step (column 2, lines 47-51).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 21 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Tabata et al. (US 6,513,970).

With respect to claims 21 and 26, Tabata et al. teaches an infrared sensor (Fig. 1, Ref. 20); a display coupled to the infrared sensor to provide a temperature reading from the infrared sensor to the user (Fig. 19, Ref. 83); and a filter for positioning between the infrared sensor and the refrigeration component or ambient air (column 2, lines 49-55).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Proctor et al. (US 4,967,567).

White et al. teaches all the limitations of claim 6 except the limitation that the prompts provide the user with instructions to set up the testing of the refrigerant based system.

Proctor et al. teaches a device for testing air conditioners comprising a video screen displaying test instructions for the operator (column 12, lines 17-18).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of White et al. and Proctor et al. to give the operator test instructions. The memory stores information, so it can store instructions for the operator and display them at the start of the test.

4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Chou et al. (US 6,330,499).

White et al. teaches all the limitations of claim 7-9 except that the processing means comprises a first processor coupled to the input means, and a second processor coupled to the first processor, the first processor providing the processing result to the second processor (current claim 7), the second processor is a Personal Digital Assistant (PDA) (current claim 8), the second processor is detachably coupled to the first processor (current claim 9).

Chou et al. teaches a system for vehicle diagnostic and health monitoring consisting of a processor coupled to a PDA with serial ports (column 3, lines 49-53).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of White et al. with the teachings of Chou et al. to form an air conditioning testing device that has a processor coupled to a PDA. This would allow the technician to view and store results on the PDA after the first processor processes them.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Renders (US 6,360,551).

White et al. teaches all of the limitations of claim 14 except the limitation that the device measures at least one of an ambient temperature; an ambient relative humidity; a compressor inlet temperature; a compressor outlet temperature; a condenser inlet temperature; a condenser outlet temperature; an evaporator inlet temperature; an evaporator outlet temperature; a TXV inlet temperature; an orifice inlet temperature; a TXV outlet temperature; an orifice outlet temperature; a vent inlet temperature; a vent outlet temperature; an accumulator or receiver inlet temperature; and an accumulator or receiver outlet temperature of the refrigerant system.

Renders teaches a method and device for testing and diagnosing an automatic air conditioning system that measures ambient temperature (column 3, line 1).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of White et al. with the teachings of Renders to form an air conditioning testing device that measures ambient temperature. Many parameters can be measured to find deficiencies in air conditioning units and White et al. and Renders merely teach measuring different parameters to find deficiencies.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Hieb et al. (US 5,232,667).

White et al. teaches all the limitations of claim 15 except the limitation that an infrared sensor is used for measuring a temperature of the refrigerant based system.

Hieb et al. teaches measuring temperature using an infrared probe (column 2, lines 62-64).

White et al. and Hieb et al. are analogous because they both teach portable monitoring systems.

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of White et al. and Hieb et al. to find the temperature of a refrigerant based system with an infrared probe. This could be used to determine the temperature without making any contact with the refrigerant (Hieb et al.; column 2, line 62).

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Clough et al. (US 5,846,833).

White et al. teaches everything claimed in claim 17 except that the refrigerant based system is stationary.

Clough et al. teaches a portable device for testing stationary refrigeration systems (column 4, lines 24-26).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of White et al. with the teachings of Clough et al. to use the testing device to test a stationary refrigerant system. Mobile and stationary systems can suffer from the same deficiencies, so the portable unit should be able to test either system.

8. Claims 19 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al. in view of Pfefferle et al. (US 6,185,945).

White et al. teaches all the limitations of claims 19 and 44 except the limitation that the device includes a refrigerant identifier coupled to the processing means to determine a type and a purity of refrigerant contained within the refrigerant based system.

Pfefferle et al. teaches using identifiers to identify the type of refrigerant in the air conditioner and its purity level (column 1, lines 29-31).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of White et al. with the teachings of Pfefferle et al. to form an air conditioning testing device coupled with an identifier to determine the type and purity of a refrigerant. A given refrigerant handling system is typically used with only one type of refrigerant and an identifier could be used to determine whether the proper type and purity of refrigerant is being used (Pfefferle et al., column 1, lines 31-34). If the incorrect type or purity level is being used, it could account for a deficiency in the air conditioning unit and using the correct type and purity of refrigerant could easily solve that problem.

9. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. in view of Takaki (US 5,779,365).

Tabata et al. teaches all of the limitations of claims 24 and 25 except the limitation that the probe comprises a light source to illuminate the refrigeration component (current claim 24) and that the light source is an LED (current claim 25).

Takaki teaches a temperature probe with an LED (column 10, lines 5 and 24).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Tabata et al. with the teachings of Takaki to form a temperature probe

with an LED. A light source attached to the probe would illuminate the object to be tested and allow for more precise measurements.

Allowable Subject Matter

10. Claims 11-13, 22, 23, 27, 28, 38-43, and 45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art, whether taken singularly or in combination, teaches the claimed invention.

Claim 11 requires that the processing means includes a Weighted Probability Inference Engine (WPIE) to construct failure mode fingerprints of the refrigerant based system.

Claim 22 requires an infrared emitter, wherein the infrared emitter is applied to the refrigeration component, the infrared emitter emits infrared radiation to the infrared sensor based on the temperature of the refrigeration component.

Claim 27 requires a thermal converter for positioning between the infrared sensor and the filter, wherein the thermal converter converts thermal energy of the ambient air into infrared energy for detection by the infrared sensor.

Claim 38 requires obtaining an external measurement result of at least one of i) an ambient temperature and ii) a relative humidity; determining at least one failure mode fingerprint result of the refrigerant based system; determining at least one pressure component-mode failure result based on the at least one failure mode fingerprint result of Step (5) and the measurement

results of at least one of Steps (3) and (4); determining a cooling effectiveness result of the system; and (8) displaying at least one of the results of Steps (3) through (7) to the user.

Claim 45 requires a) measuring a change in temperature across at least one of a plurality of components of the refrigerant based system; (b) constructing a test profile for the refrigerant based system based on the temperature measurements; (c) providing a plurality of failure modes for the refrigerant based system; (d) comparing the test profile with the plurality of failure modes; (e) determining at least one potential failure mode match based on the comparison; (f) assigning a probability to each potential failure mode match; and (g) storing each potential failure mode match into a memory based on the assigned probability.

11. Claims 29-36 and 46-47 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art, whether taken singularly or in combination, teaches the claimed combination.

Claim 29 requires an infrared sensor and an infrared emitter in temperature communication with one of the plurality of refrigeration components wherein the infrared emitter emits infrared radiation to the infrared sensor responsive to the temperature of the one refrigeration component.

Claim 33 requires an infrared sensor and an infrared emitter in temperature communication with the ambient air wherein the infrared emitter emits infrared radiation to the infrared sensor responsive to the temperature of the ambient air.

Claim 46 requires a Weighted Probability Inference Engine (WPIE) to construct failure mode fingerprints of the refrigerant based system based on the plurality of baseline operating

parameters and the plurality of operating parameters of the refrigerant bases system; a second processor coupled to the memory means and containing the WPIE, the WPIE providing the failure mode fingerprints to the second processor, the second processor displaying prompts and troubleshooting information to a user based on the failure mode fingerprints.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meagan S Walling whose telephone number is (703) 308-3084. The examiner can normally be reached on Monday through Friday 8:30 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

msw
April 7, 2003

John Barlow
Supervisory Patent Examiner
Technology Center 2800